10-3930-407-10

TM 10-3930-407-10

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL

TRACTOR, WHEELED WAREHOUSE, GASOLINE PNEUMATIC-TIRED WHEELS 4,000 POUND DRAWBAR PULL (MINNEAPOLIS-MOLINE MODEL MT 40, ARMY MODEL MHE 172)

This reprint includes all changes in effect at the time of publication; changes 4 and 5.

HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 1961

D101.11:

READEX FICHE best copy available

Changes in force: C 4

TM 10-3930-407-10
C 4

Change No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *20 April 1973*

Operator's Manual

TRACTOR, WHEELED, WAREHOUSE; GASOLINE; PNEUMATIC TIRED WHEELS; TYPE II; 4000 POUND DRAWBAR PULL (MINNEAPOLIS MOLINE MODEL MT40, ARMY MODEL MHE 172 NON-RADIO SUPPRESSED) FSN 3930-724-3471 (ARMY MODEL MHE 172, RADIO SUPPRESSED) FSN 3930-064-6563

TM 10-3930-407-10, 17 July 1961 is changed as follows:

Page 3. Paragraph 1 is superseded as follows:

1. Scope

This manual is for your use in operating and maintaining the warehouse wheeled tractor, Models MT40.

Paragraph 2*c* is rescinded.

Paragraph 3 is superseded as follows:

3. Forms and Records

a. Maintenance forms and records that you are required to use are explained in TM 38-750.

b. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Mobility Equipment Command, ATTN: AMSME-MPP, St. Louis, MO 63120.

Page 4, paragraph 6*b*. The first line is superseded as follows:

Cooling system ..... 13 qts.

Page 9, paragraph 11. The first sentence is superseded as follows: "To start the tractor, perform the daily preventive maintenance services listed in paragraph 19, and follow instructions below."

Page 10, paragraph 12. The first sentence is rescinded.

Paragraph 14. The first sentence is rescinded.

Page 12. Section I is superseded as follows:

Section I. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

18. General

To insure that the tractor is ready for operation at all times, it must be inspected systematically, so the defects may be discovered and corrected before they result in serious damage or failure. The necessary Preventive Maintenance Services to be performed are listed and described in table 1. The item numbers indicate the sequence of minimum inspection requirements. Defects found during operation of the unit shall be noted for future correction to be made as soon as operation has ceased. Stop operation immediately if a deficiency is found during operation which would damage the equipment if operation were continued. All deficiencies, and shortcomings will be recorded, together with corrective action taken, on a DA Form 2404 (Equipment Inspection and Maintenance Work-Sheet) at the earliest possible opportunity.

19. Preventive Maintenance Checks and Services

The preventive maintenance checks and services listed in table 1 must be performed by the oper-

ator or crew. The interval and sequence numbers are listed consecutively and indicate the sequence of minimum requirements.

Table 1. Operator/Crew Preventive Maintenance Checks and Services

B — Before Operation
Time required: 1.7

D — During Operation

A — After Operation
Time required: 1.0

Interval and sequence No.			Item to be inspected	Work time
B	D	A	Procedure	M/H
			NOTE Visually inspect for evidence of lubricant and fuel leaks concurrently with the daily services checks.	
1			*Fire Extinguisher.* Inspect for broken seal.	0.1
2		17	*Tires.* Inflate rear tires 25 psi and front tire to 35 psi. Check the tires for cuts and remove all foreign matter. Replace missing valve caps. (Weekly).	0.1
3		18	*Differential.* Check differential for leaks.	0.1
4		19	*Lights.* Check for defective lamp units.	0.1
5		20	*Brake Pedal.* Check the brake pedal free travel. Reserve pedal when brake is applied should be 1-to 1 1/2-inches from the floor board.	0.1
6			*Steering and Linkage.* Check steering for looseness or binding (weekly).	0.1
7		21	*Engine Oil Level Gage.* Add oil as indicated by the level gage. Reference current L. O.	0.1
8		22	*Fuel Filter.* Tighten thumb screw if gasket is leaking. (Clean weekly).	0.1
9		23	*Fuel Tank.* Add fuel as required.	0.1
10		24	*V-Belt.* Check for worn, frayed, or cracked belt.	0.1
11			*Horn.* Check for operation.	0.1
12		25	*Radiator.* Proper coolant level is 2-inches below filler neck.	0.1
13			*Batteries.* Tighten loose cables and mountings. Remove corrosion. Inspect for cracks and leaks. Fill to 1/2-inch above the plates. Clean venthole in filler cap before installing. In freezing weather run engine a minimum of 1 hour after adding water.	0.2
14		26	*Transmission.* Check for leaks.	0.1
15			*Controls and Instruments.* Inspect for damage and loose mounting. With unit operating, check for proper operation. Normal operating readings for instruments are as follows: Ammeter — Slight positive charge Oil pressure gage — 25 to 35 psi Temperature gage — 180°F.	0.2
16			*Handbrake.* Check handbrake to be sure it will hold tractor on a moderate incline. *Note 1.* *Operation* During operation observe for any unusual noise or vibration.	0.1

Page 16. Appendix I is superseded as follows:

APPENDIX I
REFERENCES

1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users

2. Lubrication

C9100IL	Fuels, Lubricants, Oils, and Waxes
LO 10-3930-407-20	Lubrication Order: Warehouse Tractor Models MT40. MHE 172, MT40MA

3. Painting

AR 740-1	Color, Marking, and Preparation of Equipment for Shipment
AR 746-5	Color and Marking of Army Materiel

4. Maintenance

TB 750-651	Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling System
TM 9-2610-200-10	Care and Maintenance of Pneumatic Tires
TM 9-6140-200-14	Operator, Organizational, Field and Depot Maintenance: Storage Batteries, Lead-Acid Type
TM 38-750	The Army Maintenance Management System (TAMMS)

5. Demolition

TM 750-244-1-3	Destruction of Materiel to Prevent Enemy Use

Page 17. Appendix II is superseded as follows:

APPENDIX II
BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED

Section I. INTRODUCTION

1. Scope

This appendix lists items required by the operator for operation of the warehouse tractor.

2. General

This list is divided into the following sections:

a. Basic Issue Items List—Section II. Not applicable.

b. Items Troop Installed or Authorized List—Section III. A list of items in alphabetical sequence, which at the discretion of the unit commander may accompany the warehouse tractor. These items are NOT SUBJECT TO TURN-IN with the warehouse tractor when evacuated.

3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items List, section II, and Items Troop Installed or Authorized, section III.

a. Source, Maintenance and Recoverability (SMR). Not applicable.

b. Federal Stock Number. This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. This column indicates the Federal item name and any additional description of the items required.

d. Unit of Measure (U/M). A two character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Furnished with Equipment (BIIL). Not applicable.

f. Quantity Authorized (Items Troop Installed or Authorized). This column indicates the quantity of the item authorized to be used with the equipment.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR code	(2) Federal stock No.	(3) Description Ref. No. & Mfr code	Usable on code	(4) Unit of meas	(5) Qty auth
	4210-889-2221	EXTINGUISHER, Fire		EA	1

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:
VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A (qty rqr block No. 893) operator maintenance requirements for Warehouse Equipment.

Changes in force: C 4 and C 5

TM 10-3930-407-10
C 5

CHANGE
NO. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *29 April 1974*

Operator's Manual
TRACTOR, WHEELED, WAREHOUSE; GASOLINE; PNEUMATIC TIRED WHEELS; TYPE II; 4000 POUND DRAWBAR PULL (MINNEAPOLIS-MOLINE MODEL MT40, ARMY MODEL MHE-172 NON-RADIO SUPPRESSED) FSN 3930-724-3471 (ARMY MODEL MHE-172, RADIO SUPPRESSED) FSN 3930-064-6563

TM 10-3930-407-10, 17 July 1961, is changed as follows:

Inside Front Cover. Add the following warning to the inside front cover:

WARNING

Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs which were fitted by a trained professional.

Page 3. Paragraph 3*b* is superseded as follows:

b. You can help to improve this manual by calling attention to errors and by recommending improvements. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander, US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished direct to you.

Page 9. Immediately after Section II title, add the following warning:

WARNING

Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs which were fitted by a trained professional.

Page 16. Appendix I, References, add the following: "TB MED 251, Noise and Conservation of Hearing".

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:
VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A (qty rqr block No. 893) Operator's Maintenance requirements for Warehouse Equipment.

TECHNICAL MANUAL
No. 10-3930-407-10

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *17 July 1961*

OPERATOR'S MANUAL

TRACTOR, WHEELED, WAREHOUSE, GASOLINE, PNEUMATIC-TIRED WHEELS, 4,000-POUND DRAWBAR PULL (MINNEAPOLIS-MOLINE MODEL MT 40, ARMY MODEL MHE 172)

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

These instructions are published for use of personnel responsible for operation and first-echelon maintenance of the Tractor, Wheeled, Warehouse, Gasoline, Pneumatic-Tired Wheels, 4,000-Pound Drawbar Pull, Minneapolis-Moline Model MT 40, Army Model MHE 172, Federal Stock Number 3930–724–3471. Instructions in this manual are applicable to tractors procured under contract number N600–MIS–53408.

2. References

a. Appendix I is a list of current references.

b. The maintenance allocation chart is published in TM 10–3930–201–20.

c. Appendix II is the basic issue item list which consists of items that are both authorized to be used by the operator and carried on the vehicle.

3. Forms and Reports

The forms and reports applicable to the operation and first-echelon maintenance of the tractor are as follows:

a. DA Form 285 (Accident (Report of Individual Accident)).

b. DA Form 110 (Vehicle and Equipment Operational Record).

c. DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual, 7, 8, or 9).

d. Standard Form 46 (United States Government Motor Vehicle Operator's Identication Card).

d. Standard Form 46 (United States Government Motor Vehicle Operator's Identification Card).

e. Standard Form 91 (Operator's Report of Motor-Vehicle Accident).

4. Orientation

Throughout this manual the use of the terms *right, left, front* and *rear* indicates directions from the viewpoint of the operator sitting in the seat of the tractor.

Section II. DESCRIPTION AND DATA

5. Description

The MT 40 warehouse tractor, Army Model MHE 172, (figs. 1 and 2) is a rear-wheel drive materials-handling vehicle. It is powered by a 40-horsepower, valve-in-head, four-cylinder, gasoline engine. This tractor has an automatic transmission equipped with a torque converter which provides a means of shifting to either high or low gear without the use of a foot clutch. The tractor also is equipped with foot-operated hydraulic brakes and a mechanical handbrake, and its drawbar-pull capacity is 4,000 pounds.

6. Tabulated Data

a. Performance.

Towing capacity:	
Level surface	90 tons
On-Grade:	
2 percent	44 tons
4 percent	28 tons
6 percent	21 tons
8 percent	16 tons
10 percent	13 tons
12 percent	11 tons
14 percent	9 tons
Speed (maximum):	
Forward	13 m.p.h.
Reverse	13 m.p.h.
Turning radius:	

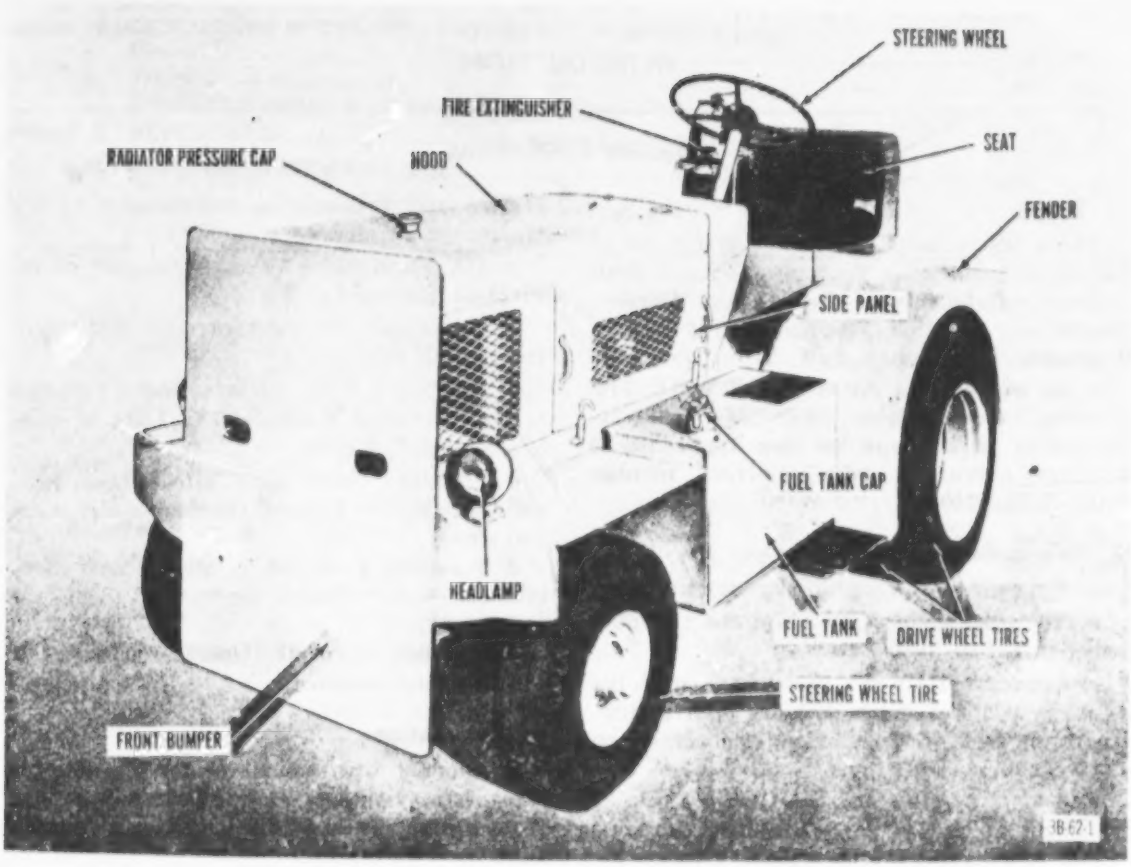

Figure 1. Minneapolis-Moline Model MT 40 tractor, three-quarter front view.

Inside ..... 40 in.
Outside ..... 120⅛ in.

b. Capacities.

Cooling system ..... 5½ gal.
Fuel tank ..... 16 gal.

c. Tire Pressure.

Drive wheels ..... 25 lbs.
Steering wheels ..... 35 lbs.

d. Dimensions and Weight.

Height (overall to top of steering wheel). 60¾ in.
Width ..... 64½ in.
Length (less coupler) ..... 96 1/16 in.
Weight ..... 5,900 lbs.
Underclearance:
Center of frame ..... 10 in.
Drive axle ..... 6¼ in.
Wheelbase ..... 62 in.
Tire size:
Drive wheels ..... 6.50 x 16, 6 ply
Steering wheels ..... 6.00 x 9, 6 ply

e. Wheel Loading.

Front wheel ..... 780 lbs.
Rear wheel ..... 2,170 lbs.
Total ..... 5,600 lbs.

f. Center of Gravity.

Horizontal ..... 16.4 in. forward from axle of rear wheels.
Vertical ..... 6.4 in. above axle of rear wheels.

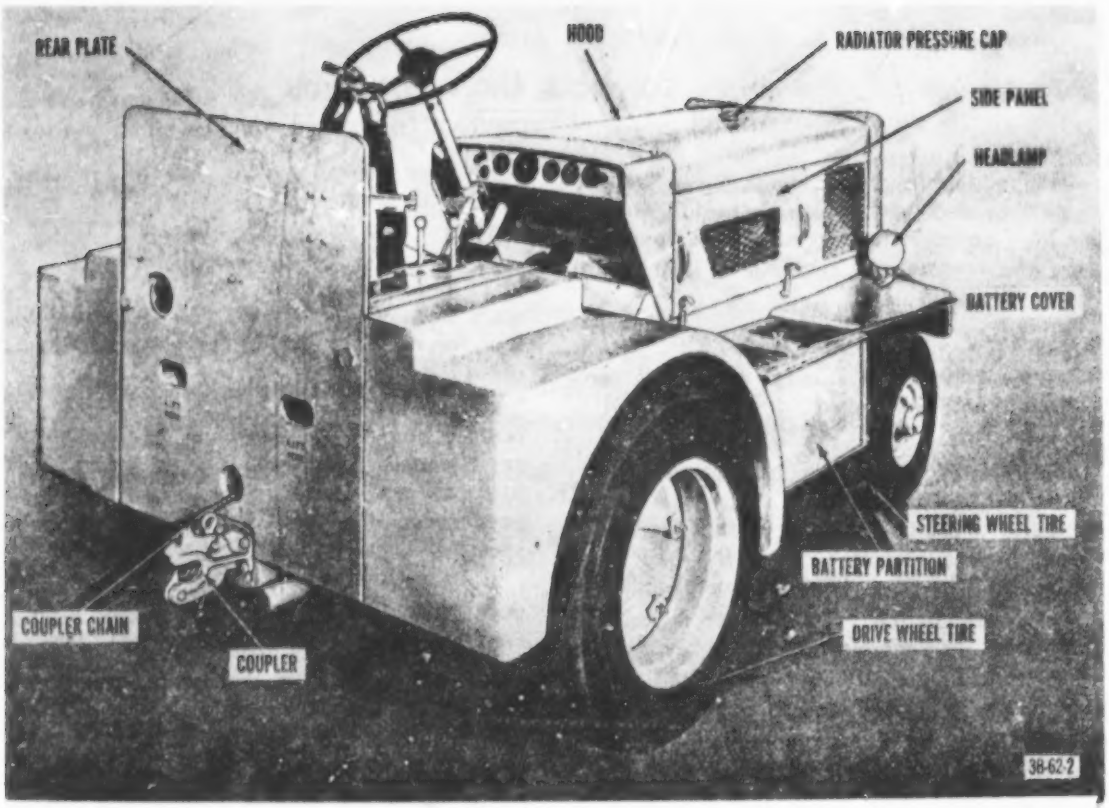

Figure 2. Minneapolis-Moline Model MT 40 tractor, three-quarter rear view.

CHAPTER 2

OPERATING INSTRUCTIONS

Note. Services performed upon receipt of the tractor are the responsibility of organizational (second-echelon) maintenance personnel. The operator will assist with these services when directed to do so by the commanding officer.

Section I. CONTROLS AND INSTRUMENTS

7. General

This section furnishes the operator with illustrations and information pertaining to both the location and the use of the various controls and instruments required to operate the tractor properly.

8. Controls

The controls, located in the operator's compartment and illustrated in figures 3 and 4, are as follows:

a. Ignition Switch. The ignition switch activates the electrical system. Turn this switch clockwise to the ON position when starting the tractor and counterclockwise to the OFF position when the tractor is not in operation.

b. Starter Switch. The starter switch activates the starting motor that cranks the engine. Depress this switch to start the engine and release it as soon as the engine starts. Do not depress the switch longer than 8 seconds. If the engine does not start on the first try, let the engine and the starting motor come to a complete stop before trying again.

c. Choke Rod. The choke rod is used to enrich the mixture of gasoline required to start the engine by reducing the amount of air flowing into the mixture. This enriched mixture may be necessary to start the engine when the weather is cold or when the tractor has been idle for a long period of time. Pull out the choke rod to enrich the mixture. As the engine reaches normal operating temperature, gradually push the rod all the way in to restore it to its normal position.

d. Transmission Shift Levers. There are two transmission shift levers—a high- and low-range hand lever and a forward-and-reverse hand lever. Push the high- and low-range hand lever all the way forward for high range; into its center position for neutral; and all the way rearward for low range. Push the forward-and-reverse hand lever all the way forward to move in reverse; into its center position for neutral; and all the way rearward to move forward.

e. Accelerator Pedal. The accelerator pedal is used both to increase and to decrease the engine speed. Depress the accelerator pedal to increase the engine speed and release the pressure on the pedal to decrease the engine speed.

f. Service Brake Pedal. The service brake pedal controls the hydraulic brakes and the stoplight. It is foot operated. Depress the brake pedal to stop the tractor and to activate the stoplight. Release the pressure on the pedal before putting the tractor in motion.

g. Horn Button. Press the horn button to sound the horn.

h. Steering Wheel. The steering wheel is used to guide the tractor. Turn the wheel clockwise to guide the tractor to the right and counterclockwise to guide the tractor to the left.

i. Light Switch. The light switch closes and opens the circuit that controls the headlamps and the taillamps. Pull the switch out to turn on these lights and push the switch in to turn off the lights.

j. Parking Brake Hand Lever. The parking brake hand lever operates the brakes that hold the tractor in a stationary position when it is not being operated. Pull the hand lever up to

hold the tractor stationary and push to down to release the parking brakes.

k. Coupler Disconnect Lever. The coupler disconnect lever cocks the latch on the pintle hook and disengages the drawbar eye of equipment being towed. To disengage equipmen from the pintle hook, pull the coupler disconnect lever rearward sharply.

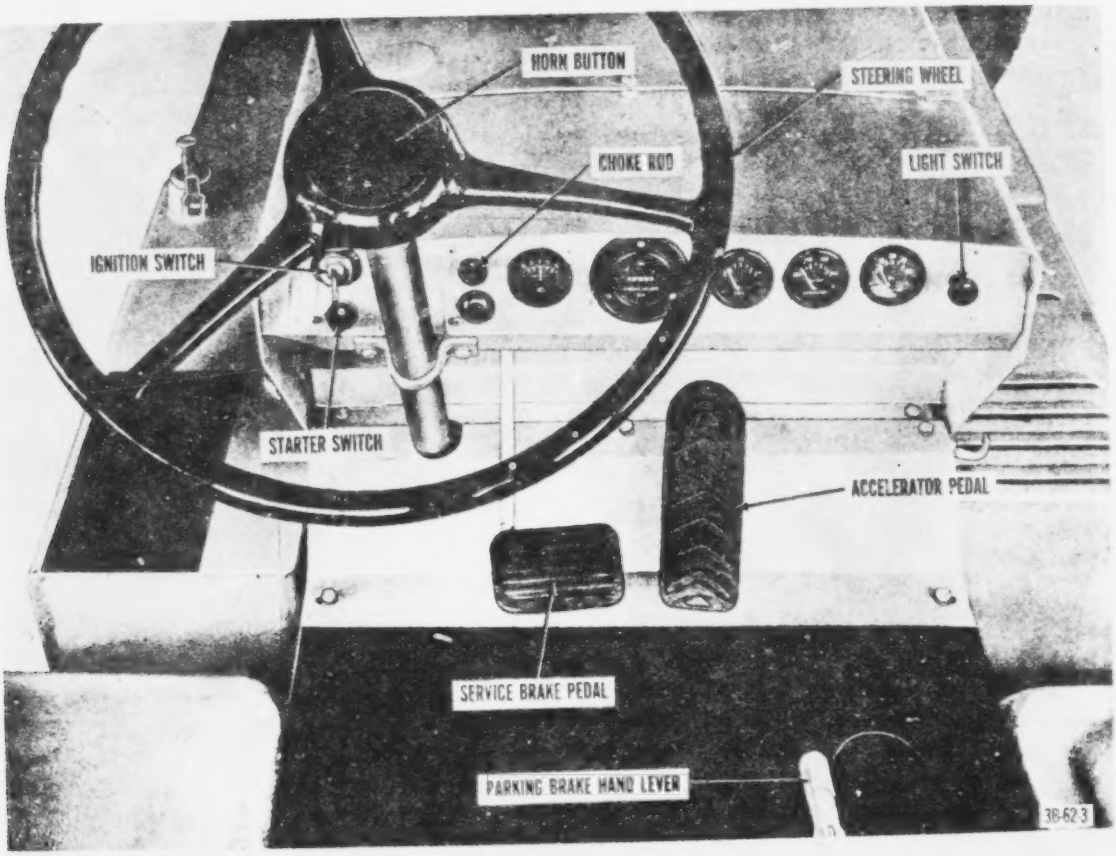

Figure 3. Controls.

9. Instruments

The instruments, located on the instrument panel in the operator's compartment and illustrated in figure 5, are as follows:

a. Oil Pressure Gage. The oil pressure gage indicates the pressure of the oil in the engine lubrication system; and at normal operating temperature and governed speed, this gage should show from 25 to 35 pounds of pressure per square inch. If the gage fails to show the proper pressure reading, stop the engine immediately and do not operate the tractor again until the cause of the malfunction has been determined and corrected.

b. Engine Temperature Gage. The engine temperature gage indicates the temperature of the engine cooling fluid. Under normal conditions, this temperature should be approximately 180° F. (Fahrenheit). When the gage denotes temperatures excessively higher or lower than 180° F., stop the engine and do not operate the tractor again until the cause of the malfunction has been determined and corrected

c. Fuel Gage. The fuel gage indicates the amount of gasoline in the tractor fuel tank.

d. Ammeter. The ammeter indicates the amount of current being put into or withdrawn from the battery. When the engine is running at full governed speed and the battery is fully

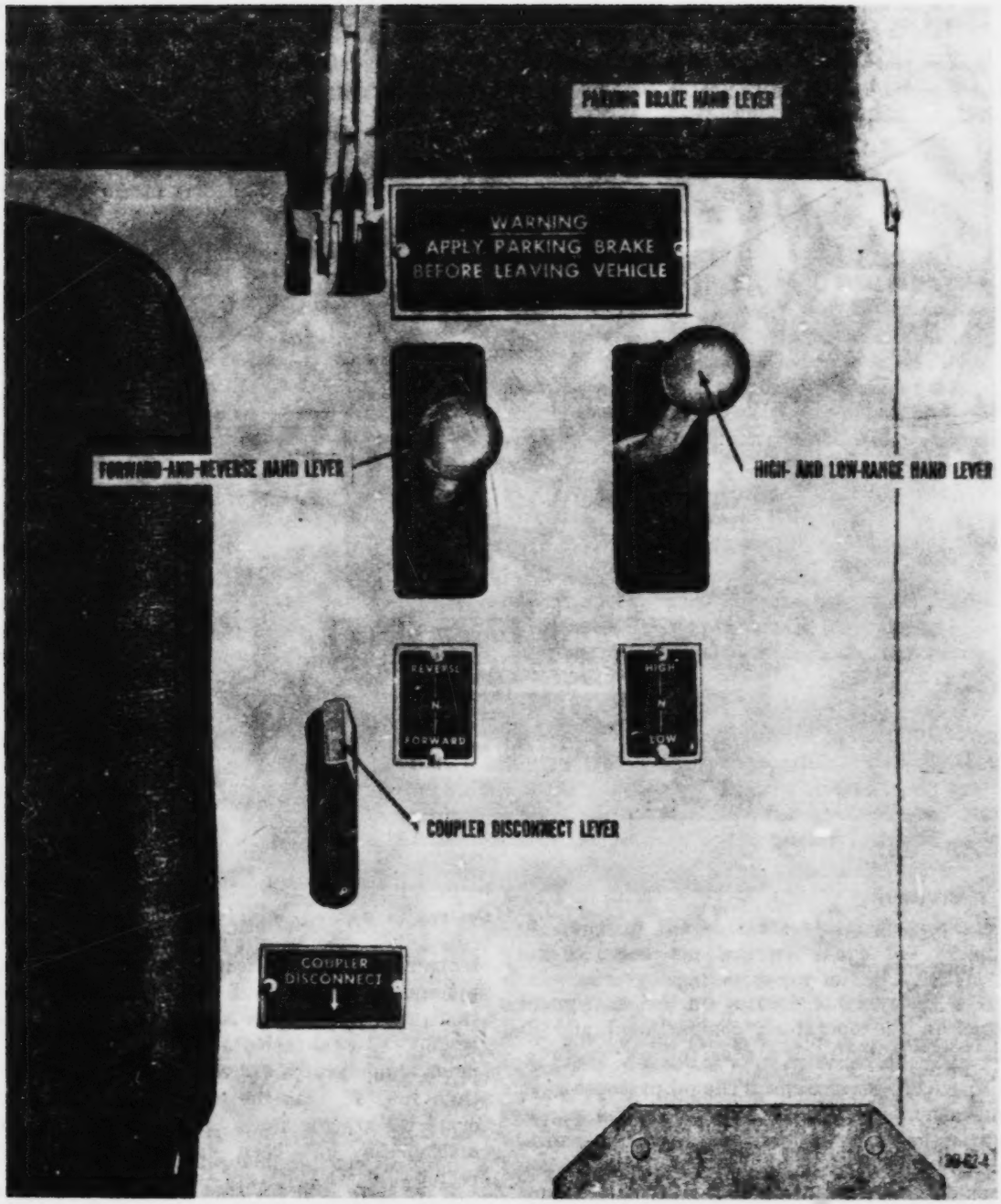

Figure 4. Operating control levers.

charged, the needle on the ammeter should move slightly to the positive side of the "0" mark on the dial. When the needle indicates a constant discharge, stop the engine and report the condition to the proper authority.

e. Hour Meter. The hour meter indicates the total number of hours the engine has been in operation.

f. Red Warning Light. The red warning light glows when the temperature within the transmission exceeds that required for normal operation. When this light glows, stop the engine and do not operate it again until the cause of the malfunction has been determined and corrected.

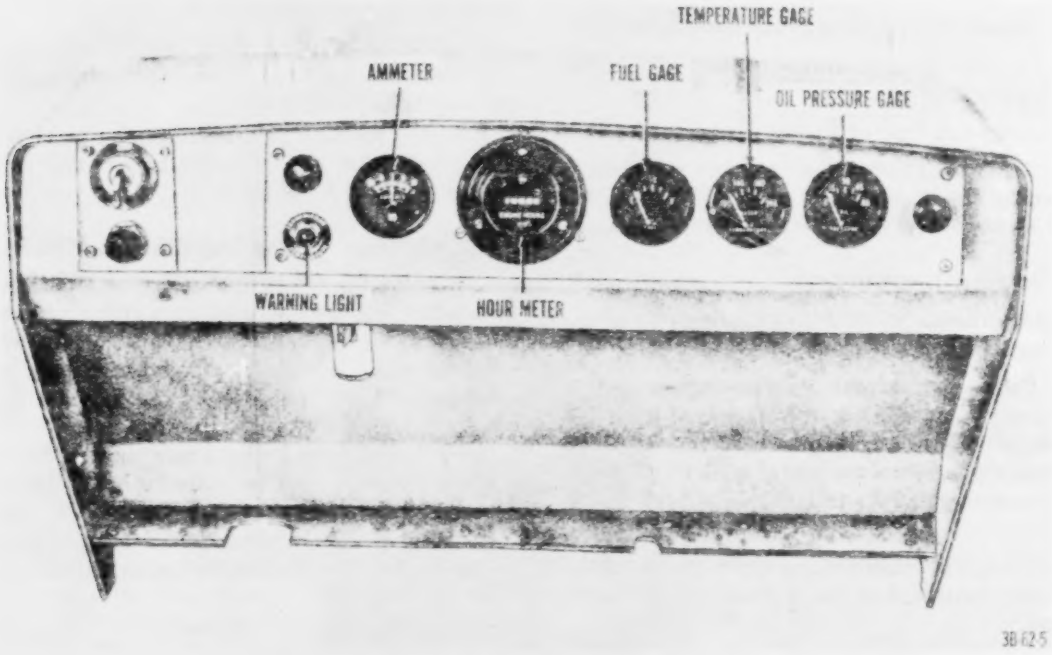

Figure 5. Instruments.

Section II. OPERATION UNDER USUAL AND UNUSUAL CONDITIONS

10. General

This section gives instructions on starting, driving, and stopping the tractor. It also gives instructions for towing items of equipment. Under special conditions, the operator may have to vary these procedures to fit a particular job. Paragraph 15 covers operation under unusual conditions.

11. Starting Instructions

To start the tractor, perform the before-operation services listed in paragraph 19*a* and follow the instructions below.

a. Pull up the parking brake hand lever to make certain the tractor remains in a stationary position while it is being started.

b. Place either one or both transmission levers in the neutral position.

c. Turn the ignition switch to ON position.

d. If the engine is cold, pull the choke rod all the way out.

e. Press the starter switch and release it as soon as the engine starts. Allow the engine to idle until its operating temperature, 180° F., is attained.

f. As the operating temperature rises, slowly push the choke rod all the way in.

g. Check all instruments (par. 9) to be certain they are operating properly.

12. Driving Instructions

To drive the vehicle, follow the instructions below and perform the during-operation services listed in paragraph 19*b*.

a. Move the transmission shift levers into the positions desired.

b. Release the parking brake hand lever.

c. Depress the accelerator pedal until normal driving speed is attained.

d. Steer the tractor in the direction desired.

e. Bring the tractor to a complete stop before changing the position of either transmission shift lever.

13. Towing Instructions

When towing items of euipment, follow the instructions below.

a. Following instructions given in paragraph 12, slowly move the tractor rearward until the drawbar eye on the equipment to be towed springs the latch on the pintle hook of the tractor coupler (fig. 2) and becomes firmly locked to it.

b. Move the transmission shift levers to the positions desired and tow the item to its destination.

c. To uncouple the equipment being towed, follow directions given in paragraph 8*k*.

14. Stopping Instructions

To stop the vehicle, follow the instructions below and perform the after-operation services listed in paragraph 19*c*.

a. Stop the tractor by taking foot off the accelerator pedal, placing it on the service brake pedal, and applying pressure as required.

b. Move either of the two transmission shift levels into the neutral position.

c. Turn the ignition switch to OFF position.

d. Set the parking brakes by raising the parking brake hand lever.

e. If the headlamps and taillamps are burning, turn them off by pushing in the light switch.

15. Operation Under Unusual Conditions

Generally, the Minneapolis-Moline Model MT 40 tractor will be operated in warehouses and on hard surfaces. Therefore, operating instructions, in most instances, will be the same regardless of the conditions of the weather and the terrain. Where it does become necessary to operate the tractor under abnormal conditions such as extreme cold or extreme heat, the operator should carefully follow the before-, during-, and after-operation services listed in paragraph 19 and the preventive maintenance services for operation under unusual conditions listed in paragraphs 20 through 23.

Section III. OPERATION OF EQUIPMENT USED IN CONJUNCTION WITH MAJOR ITEM

16. General

This section contains operating instructions on the portable fire extinguisher (fig. 6) that is supplied with the tractor.

17. Operation of Fire Extinguisher

First disconnect the clamp that secures the extinguisher to the mounting bracket, swing the clamp open, and remove the extinguisher from the tractor. Hold the extinguisher by its carrying handle and pull the pin that is secured to the handle by a chain. Lift the nozzle on the extinguisher until it forms an approximate right angle with the extinguisher. Point the nozzle at the base of the fire, and depress the discharge lever above the carrying handle.

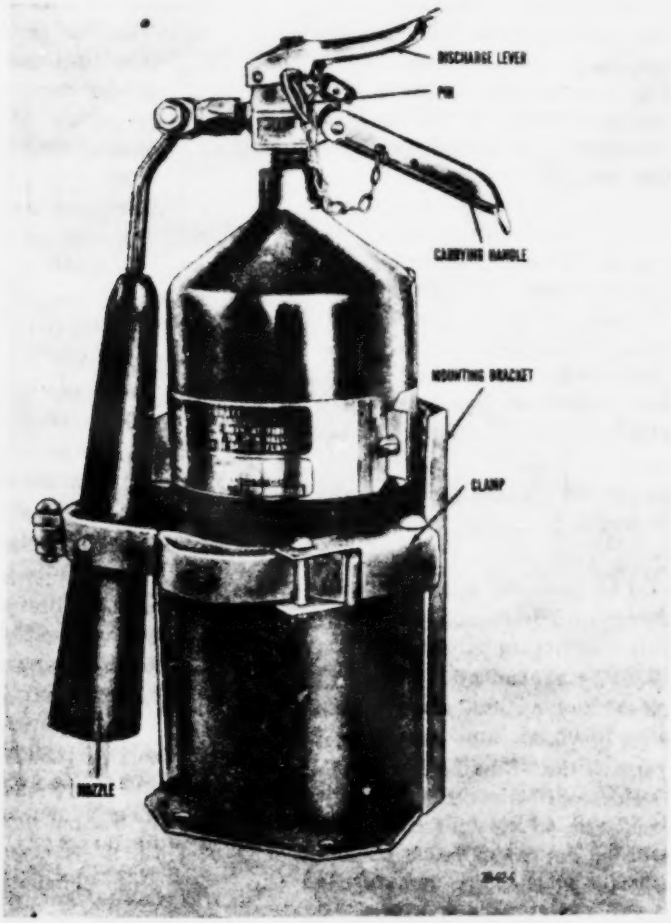

Figure 6. Fire extinguisher.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE SERVICES UNDER USUAL CONDITIONS

18. Operator Responsibilities

The operator is responsible for performing daily preventive maintenance services before, during, and after operation of the tractor. The operator is also responsible for performing weekly services to supplement those performed daily. The purposes of these services are to detect electrical and mechanical failures at an early stage and to insure that appropriate corrective action is taken before expensive time-consuming repairs are required. The services listed in DD Form 1-10 (Vehicle and Equipment Operational Record) may be used as a checklist for items to be inspected. This form should be in the operator's possession whenever he operates the tractor.

19. Operator Servicing

a. Before-Operation Services. Before-operation services to be performed by the operators are as follows:

(1) Visually inspect the tractor to see that all components are present and in good condition.

(2) Check for indications of gas, oil, and water leaks.

(3) Inspect the fuel, oil, and water levels.

(4) Start the engine and allow it to idle for at least 2 minutes. Check all instruments to be certain the engine is functioning properly. If an instrument fails to function properly, report the fact to the proper authority.

(5) See that the fire extinguisher is present, properly sealed, and mounted.

(6) Make certain that Standard Form 91 and DD Form 110 are on the tractor. Standard Form 46 must be carried by the operator.

b. During-Operation Services. During-operation services to be performed by the operator are as follows:

(1) Observe instruments frequently for any indication of trouble in a system to which an instrument applies.

(2) Test the service brakes to be certain they stop the tractor within a reasonable distance without side pull. Also, be certain that the handbrake is capable of holding the tractor on an incline.

(3) Test the steering action to discover any malfunctioning that may exist.

(4) Listen for rattles, knocks, squeaks, or hums that may indicate trouble; and be alert to odors that may indicate an overheated component.

c. After-Operation Services. After-operation service to be performed by the operator are as follows:

(1) Inspect tires for cuts in the casements and gravel in the treads.

(2) Check the fuel, oil, and water levels and replenish supplies as necessary.

(3) Report to the proper authority any malfunction discovered.

d. Weekly Services. Weekly services to be performed by the operator are as follows:

(1) Inspect the fan belt to be certain it has maintained its proper tension (par. 20*a*(1)).

(2) Check the level of the elecrolyte in the battery (par. 20*b*).

(3) Examine tires for unusual wear and correct inflation.

(4) Clean the tractor.

(5) In season, have the specific gravity of the antifreeze in the radiator checked.

(6) Note deficiencies on DD Form 110.

Section II. PREVENTIVE MAINTENANCE SERVICES UNDER UNUSUAL CONDITIONS

20. Extremely Hot, Dry Climates

The following precautions should be taken whenever the tractor is operated in extremely hot climates.

a. Cooling System.

(1) Check the fan belt frequently to be certain that it maintains a ½-inch deflection at a point midway between the pulley centers. Have adjustments made as necessary.

(2) Check the coolant frequently to be certain it is at the bottom of the filler neck.

(3) Be sure radiator cap is on securely.

(4) Check the cooling system often.

(5) Keep the external parts of the radiator clean.

(6) Check hoses and nonmetallic gaskets frequently. Report defects to the proper authority.

b. Electrical System. Check electrolyte level in the battery frequently, maintaining it ⅛ inch above the plates. Have the specific gravity of the electrolyte checked frequently.

c. Fuel System. Keep the fuel tank as full as possible to reduce condensation.

d. Tires. Inspect tires frequently to be certain they are wearing evenly and maintaining the proper air pressure (par. 6*c*).

21. Extremely Cold Climates

The following precautions should be taken whenever the tractor is operated in extremely cold climates.

a. Shelter. The tractor should be stored in heated shelter. If a shelter is not available, cover the tractor with tarpaulin or similar material.

b. Cooling System.

(1) Have proper amount of antifreeze compound added to cooling system.

(2) When antifreeze is not available and the tractor is not to be used, have the radiator and the cylinder block drained whenever the temperature is expected to be 32° F., or lower. Attach a tag to the steering wheel to warn personnel that the cooling system has been drained.

(3) When adding water to a radiator that contains antifreeze, allow the engine to run long enough for the water to mix well with the antifreeze. Have the mixture checked with a hydrometer.

(4) Keep the fuel tank as full as possible to reduce condensation.

c. Electrical System.

(1) Have the specific gravity of the battery electrolyte checked frequently.

(2) Keep the battery fully charged at all times to prevent it from freezing.

(3) Operate the engine for a minimum of 1 hour after water has been added to the battery. This operation will allow the water and the electrolyte to mix and, consequently, eliminate the danger of the water freezing in the battery.

(4) Whenever shelter for the tractor is not available, remove the battery from the tractor and store the battery in a warm place.

(5) Check all electrical wires, connections, and cables to see that they are clean, dry, and secure. Handle electrical wires carefully to prevent the insulation on them from cracking.

22. Sandy Terrain

The following precautions should be taken when the tractor is operated in sandy terrain.

a. Take the precautionary measures necessary to prevent sand and dust from entering the fuel system.

b. Loosely tie a single-layer cloth bag over the air cleaner.

c. Wipe the dust and sand off the tractor with a cloth or blow them off with compressed air that does not exceed 30 pounds of pressure per square inch.

d. Be certain the crankcase breather cap is in its proper place and fastened securely. Clean the cap by dipping it several times in SD (Solvent, drycleaning).

23. Tropical Climates

The following precautions should be taken when the tractor is operated in tropical climates.

a. Take the precautions necessary to keep the radiator grill free of insects, mud, and leaves.

b. Keep the fuel tank as full as possible to reduce condensation.

c. Keep tires inflated to the pressure recommended.

d. Check controls and instruments frequently to be certain that are free of insects, webbing, and other items that may impair their functioning.

e. Lubricate battery terminals frequently.

f. Check all painted surfaces frequently; and report all scratches, cuts, chips, and abrasions to the proper authority.

g. Have parts fungusproofed whenever it is necessary.

h. Check the level of the electrolyte in the battery frequently.

Section III. TROUBLESHOOTING

24. Purpose

Troubleshooting is the process of diagnosing the causes of troubles and making the necessary corrections and is the responsibility of the organization to which the equipment is assigned.

25. Troubleshooting Chart

The troubleshooting chart discusses those troubles that can be corrected by the operator of the tractor. It lists troubles, probable causes, and remedies. When the remedy suggested in the chart does not correct the trouble, the operator should report the malfunction to the proper authority.

TROUBLESHOOTING CHART

Trouble	Cause	Remedy
Engine is hard to start or fails to start.	Insufficient fuel supply	Add fuel.
	Ignition switch not on	Turn on ignition switch.
	Low battery charge	Have battery recharged.
Engine starts but fails to keep running.	Insufficient fuel supply	Check fuel supply at carburetor. Make sure fuel shutoff valve is open. Check fuel lines and filter.
Engine backfires but will not start.	Moisture in ignition parts	Wipe all dirt and moisture from coil, spark plugs, ignition cables, and interior of distribution cap.
Engine misfires under load	Engine overheating	Check cooling system. Add water if necessary.
Engine overheats	Low coolant level	Have colant added and check for leaks.
High oil consumption	Engine overheating	Report to proper authority.
Low oil level	Low crankcase level	Add oil.

CHAPTER 4

DEMOLITION OF TRACTOR TO PREVENT AGGRESSOR USE

26. General

a. This chapter contains instructions which the operator of the tractor must follow when he is given the order to destroy his equipment or to make it inoperative to prevent its use by the aggressor.

b. The responsible unit commander must decide either to destroy the tractor or to render it inoperative. Several methods of demolishing equipment may be employed. However, it is essential to destroy the same vital parts of all tractors and all corresponding repair parts, regardless of the method of demolition selected.

27. Training

All operators should be thoroughly trained in the methods of destroying the tractor. During the training period, it should be emphasized that generally only a little time is available to perform demolition operations. For this reason, it is necessary that an operator be thoroughly familiar with all methods of destroying the tractor; and he should be able to perform these operations without having to refer to this or any other publication.

28. Demolition to Render the Tractor Inoperative

a. Demolition by Mechanical Means. To demolish a tractor by mechanical means, an operator should use any heavy tool available, such as a crowbar, a pick, or an ax, which may be used to destroy the carburetor, spark plugs, generator, oil filter, steering wheel, belts, fan, water pump, radiator, and wiring.

b. Demolition by Misuse. To render a tractor inoperative by misuse, an operator may drain the radiator and the engine crankcase, disconnect the radiator fan, and run the engine at full throttle. He may also place sand, gravel, nuts, bolts, screws, or broken glass into the fuel tank, the oil filler tube, and the radiator.

c. Other Demolition Methods. In addition to using the methods described above to demolish a tractor, the operator may also remove from the tractor easily accessible parts such as the carburetor, the generator, and the distributor and either bury them in dirt or sand or throw them into a lake or some other body of water. The operator may also pack rags, clothing, and canvas around and inside the tractor, saturate them with gasoline, oil, or diesel fuel, and set them afire. If a large body of water such as a river or a lake is available, the operator may submerge the tractor in it.

APPENDIX I

REFERENCES

AR 320–5	Dictionary of United States Army Terms
AR 320–50	Authorized Abbreviations and Brevity Codes
AR 385–40	Accident Reporting and Records
DA Pam 108–1	Index of Army Motion Pictures, Filmstrips, Slides, and Phono-Recordings
FM 21–5	Military Training
FM 21–6	Techniques of Military Instruction
FM 21–30	Military Symbols

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APPENDIX II

BASIC ISSUE ITEM LIST

Section I. INTRODUCTION

1. Scope

This appendix lists all accessories, tools, repair parts, and publications issued with the Tractor, Wheeled, Warehouse, Gasoline, Pneumatic-Tired Wheels, 4,000-Pound Drawbar Pull, Mineapolis-Moline Model MT 40, Army Model MHE 172, Federal Stock Number 3930–724–3471.

2. Explanation of Columns

a. Technical Service Code. The following code symbols appearing in this column indicate the supplying technical service.

9—Ordnance
5—Corps of Engineers
12—Adjutant General's Corps

b. Source, Maintenance, and Recoverability Code.

(1) *Source code.* The following code symbol indicates the selection status and the source of supply for each repair part.

"P"—applied to repair parts which are high mortality parts; procured by technical services; stocked in and supplied from the technical service depot system; and authorized for use at indicated maintenance echelon.

(2) *Maintenance code.* The following code symbol indicates the lowest maintenance echelon authorized to receive these accessories, repair parts, tools, and publications.

"O"—Organizational maintenance (first echelon).

(3) *Recoverability code.* The following code symbols indicate that a repair part has been designated as a recoverable item. The symbols are applied as follows:

"R"—applied to repair parts and assemblies which are economicaly repairable and, when available, are furnished by supply on an exchange basis.

"S"—applied to repair parts which may be placed in "Ready-for-Issue" condition by operations such as cleaning, replating, anodizing, adjusting, and welding.

c. Federal Stock Number. This column lists the 11-digit Federal stock number for requisitioning and stockage purposes.

d. Description. This column lists the items by the nomenclature that will be used for requisitioning purposes. This column may also contain the manufacturer's code and part numbers.

e. Unit of Issue. This column lists the smallest quantity in which the item will be issued.

f. Expendability. This column is used to designate by the letters "NX" items that are nonexpendable.

g. Quantity Authorized. This column indicates the quantity of an item authorized for issue with the equipment.

h. Illustrations.

(1) *Figure number.* This column contains the number of the figure that illustrates the item.

(2) *Item number.* This column contains the number that identifies the item on the illustration.

Section II. FUNCTIONAL PARTS LIST

Codes				Federal stock number	Description	Unit of issue	Expendability	Quantity authorized	Illustrations	
Technical service	Source	Maintenance	Recoverability						Figure number	Item number
					Equipment					
9	P	O	....	6140-057-2554	BATTERY, Storage, 12 volt, charged and dry type 6 TN, 100 amp. hr. capacity, 6 cell, overall dimensions—length 11¼ in., width 10½ in., height 8 15/16 in.	ea	....	1		
9	P	O	....	6810-249-9354	SULPHURIC ACID, Electrolye, dilute, specific gravity 1.280, 1-gal. container.	ea	....	2		
5	P	O	....	4210-223-9912	FIRE EXTINGUISHER, 5 lb., CO_2	ea	....	1	6	
					Repair Parts					
					None authorized for 1st echelon maintenance.					
					Special Tools					
					None required for 1st echelon maintenance.					
					Publications					
12	....	....	....		TM 10-3930-407-10 (Operator's Manual; Tractor, Wheeled, Warehouse, Gasoline, Pneumatic-Tired Wheels, 4,000-pound Drawbar Pull (Minneapolis-Moline Model MT 40, Army Model MHE 172)).	ea	....	1		
					Manufacturer's Technical Manual No. S-278, dated 30 October 1960.	ea	....	1		

BY ORDER OF THE SECRETARY OF THE ARMY:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

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except TQMG (10)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (5)
LOGCOMD (1)
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USAQMS (10)
GENDEP (5)
Army Tml (3)
QMRECOMD (2)
Unit org under fol TOE:
3-117 (2)
5-279 (2)
8-187 (2)
9-197 (2)
9-367 (2)
10-22 (2)
10-127 (2)
10-227 (2)
10-337 (2
10-347 (2)
10-348 (2)
10-357 (2)
10-367 (2)
10-407 (2)
10-417 (2)
10-427 (2)
10-447 (2)
10-467 (2)
10-500 (EA, EB, ED, EE, EG, FE) (2)
10-521 (2)
10-536 (2)
29-51 (2)
29-53 (2)
55-457 (2)
55-500 (BE, BF, BG, JC) (2)
55-260 (2)
57 (2)

NG: State AG (3).

USAR: Units—same as Active Army except allowance is one copy to each unit. For explanation of abbreviations used, see AR 320-50.

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